Installation and User Guide

living eco®
Electronic Radiator Thermostat

Congratulations on the purchase of your *living eco*® radiator thermostat

living eco® is an electronic radiator thermostat with programmes to automatically lower the room temperature for selected periods. This allows you to save heating expenses and benefits the environment by using less energy.

For further information, please see

www.danfoss.com/living

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1. Installation

1.1 In the package

living eco® is supplied with adapters for Danfoss RA valves and valves with M30 x 1.5 (K) connections, two alkaline AA batteries and a 2 mm Allen key.

1.2 Inserting the batteries

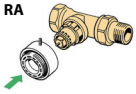
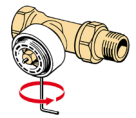
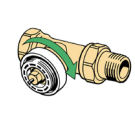
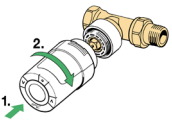
Remove the battery cover and insert the two batteries. Make sure the batteries are correctly oriented.

1.3 Setting the time and date when you start using *living eco*®

Once the batteries are installed	The time will flash on the display - 23:59.
Set the time	Set hours using ∨∧ and press ⊙. Set min. using ∨∧ and press ⊙.
Set date	Set date using ∨∧ and press ⊙. Format: day/month/year (DD/MM/YYYY)
Confirm setting	When ✓ flashes, press ⊙ to confirm.

1.4 Installing *living eco*®

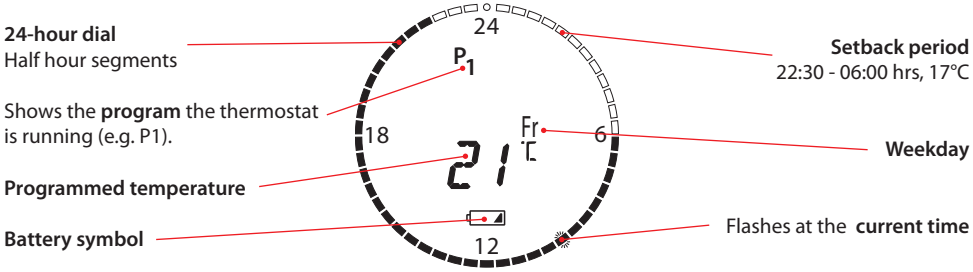
⊓ must be flashing on the display prior to installing. If not, see Installation mode on page 11.

1. Start by mounting the adapter.		
2. Tighten RA adapter using the 2 mm Allen key. Hand-tighten K adapter (max. 5 Nm).		
3. Screw the thermostat onto the adapter and tighten by hand (max. 5 Nm).		
4. Press ⊙ for approx. 3 seconds to enter the function menu.		
5. A small ⊓ flashes, press ⊙ to fix the thermostat.		

2. Getting started with *living eco*®

2.1 Thermostat display

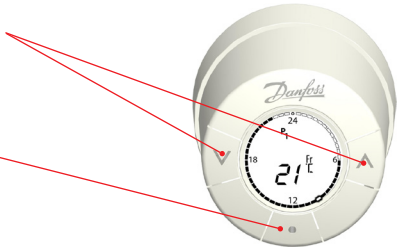
The black dashed circle on the display shows a 24-hour dial. The black segments represent periods of comfort temperature, 21°C (default setting), and the 'empty' segments represent setback periods, where the temperature is 17°C (default setting). The display also shows the set temperature and current program.



2.2 Thermostat buttons

The thermostat has two arrow buttons which allow you to navigate the display, menus and set the temperature.

Use to select and confirm.



2.3 Display symbols

Symbols flash when they can be activated.

Programme Menu	
P_0	Programme with ***no*** automatic temperature reduction – maintains a constant temperature all day and night. You select the temperature.
P_1	Saving programme which ***lowers*** the temperature to 17°C at night (22:30 - 06:00 hrs). Saving programme is configurable.
P_2	Extended saving programme which ***lowers*** the temperature to 17°C at night (22:30 - 06:00 hrs), and during the day on weekdays (08:00 - 16:00 hrs). Saving programme is configurable.
	Travel programme which ***lowers*** the temperature when you are away. You select the period and the temperature.

Function Menu	
	Installation mode (see page 11).
	Child lock.
MAX MIN	Set the max and min temperature range.
	Set time and date.

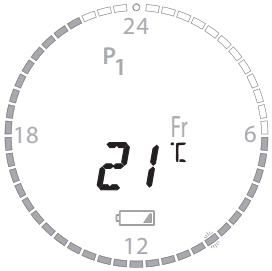
Other Symbols	
	Back.
	Confirm selection.
	Battery symbol (indicates low battery).
	Period setting for the travel programme.

3. More features of *living eco*®

3.1 Adjusting the temperature

Set the desired temperature by pressing ∨∧.
Default setting is 21°C.

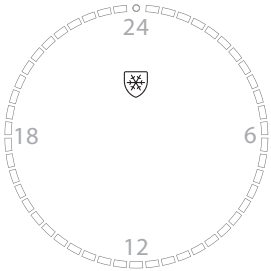
This also allows the temperature to be changed temporarily during a set-back period, without having to change the program or period.



If the comfort temperature is changed, e.g. from 21°C to 22°C, living eco® will remember this change, and the comfort temperature will remain 22°C after the next setback period.

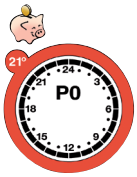
3.2 Frost protection, 6°C

This symbol is displayed if you set the thermostat to its lowest setting. This means that the thermostat will maintain a constant temperature of 6 °C in the room, ensuring frost protection.

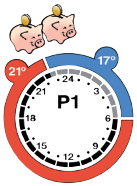


3.3 Programmes

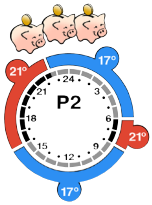
When you start using the thermostat it is set to use program **P1**. You can select the programme which best matches your family's requirements.



P0: Constant temperature of 21°C all day and night.



P1: One setback period at 17°C every night from 22:30 - 06:00 hrs.



P2: Two setback periods at 17°C every night from 22:30 - 06:00 hrs and all weekdays from 08:00 - 16:00 hrs.

3.4 Selecting the programme

Select programme menu	If the display is off, press ⊙. Then press ⊙ briefly to open the programme menu.
Selecting the programme (P0, P1 or P2)	Switch between programmes using ∨∧. Select using ⊙.
Confirm setting	When ✓ flashes, press ⊙ to confirm.

3.5 Adjusting the setback period in programme P1 or P2

The thermostat default setting is one setback period for P1 and two setback periods for P2. You can adjust the setback periods so they match your family's requirements.

When living eco® is set to change from 17°C to 21°C, e.g. at 06.00 hrs, the thermostat will learn when to start heating in order for the temperature to reach 21°C at 06.00 hrs.

Select programme menu	If the display is off, press ⊙ to activate. Then press ⊙ briefly to open the programme menu.
Select programme (P1 or P2)	Press ∨∧ to highlight the desired programme. When the programme flashes, press ⊙ to select it.
Weekdays for setback period	<table><tr><td>*Mo*</td><td>*Tu*</td><td>*We*</td><td>*Th*</td><td>*Fr*</td><td>*Sa*</td><td>*Su*</td></tr><tr><td>*Monday*</td><td>*Tuesday*</td><td>*Wednesday*</td><td>*Thursday*</td><td>*Friday*</td><td>*Saturday*</td><td>*Sunday*</td></tr></table> You can select to adjust the setback period for the weekend, all weekdays, or a single day. Use ∨∧ to select the desired period. When the desired period flashes, press ⊙ to select it.
Setback period interval	You are using ∨∧ to move around the 24-hour dial. For example when moving from one setback period to the next setback period. Use ∨∧ to move between the start and stop times. The time flashes **slowly** when it can be selected. Select time using ⊙. Once the time has been selected it flashes **faster** to indicate it can now be adjusted. Set the start and stop time using ∨∧. Once the time is chosen, confirm using ⊙.
Change temp. if required	The temperature now flashes. Set the temperature using ∨∧. Once the desired temperature is chosen, confirm using ⊙. ✓ now flashes. *(If you do not wish to change the setback period, press ∨ so that the ⮌ symbol flashes, and then select using ⊙. You will be returned to the weekdays for setback period selection menu).* Press ⊙ to approve the entire setback period.
Confirm setback period	✓ flashes. Press ⊙ to run the selected programme.

3.6 Deleting a setback period

You can delete a setback period by minimising it to half an hour. All segments on the timer dial will then become black.

Example	In this **example** the setback period is Monday, 08.30-16.00 hrs. To cancel the setback period, set the start time to 15.30 hrs.
Select programme menu	If the display is off, press ⊙ to activate. Then briefly press ⊙ to open the programme menu.
Select programme (P1 or P2)	Press ∨∧ to highlight the desired programme. When the programme flashes, press ⊙ to select it.
Select setback period	Cycle through the weekdays using ∨∧. When the day(s) you wish to change flashes, press ⊙. Cycle through the 24-hour dial using ∨∧. When the start of the setback period you wish to delete flashes slowly, press ⊙ to select it.
Clear setback period interval	Use ∧ to set the start time so the setback period is half an hour. Once you have changed the start time, press ⊙.
Confirm deletion	✓ now flashes. Press ⊙ to approve. You have now deleted the setback period.

3.7 Creating a new setback period in P1 or P2

living eco® also allows you to create your own setback periods in P1 or P2. You can create up to three setback periods each day.

Select programme menu	If the display is off, press ⊙ to activate. Then briefly press ⊙ to open the programme menu.
Select programme (P1 or P2)	Press ∨∧ to highlight the desired programme. When the programme flashes, press ⊙ to select it.
Weekdays for setback period	*Mo* *Monday* / *Tu* *Tuesday* / *We* *Wednesday* / *Th* *Thursday* / *Fr* *Friday* / *Sa* *Saturday* / *Su* *Sunday* You can select to adjust the setback period for the weekend, all weekdays, or a single day. Use ∨∧ to find the desired period. When the desired period flashes, press ⊙ to select it.
Setback period interval	To add another setback period, use ∨∧ to move around the 24-hour dial to find and select the new start time. Disregard existing setback periods, just move ahead with ∨∧ to choose your new setback period. Confirm the start time by pressing ⊙. The stop time now flashes. Set the stop time using ∨∧. Once the time is chosen, confirm using ⊙.
Change temp. if required	The temperature now flashes. Set the temperature using ∨∧, and confirm using ⊙.

Confirm setback period	✓ continues flashing. *(If you do not wish to create a new setback period, press ∨ so that the ⮌ symbol flashes, and then select using •. You will be returned to the weekdays for setback period selection menu).* Press • to approve the entire setback period.

3.8 Travel programme

The travel programme helps you save energy by reducing the temperature when you are away from home. Simply enter the period of time you will be away, and *living eco*® will ensure your normal operating programme is resumed when you return, so you arrive into a warm house.

Select programme menu	If the display is off, press • to activate. Then briefly press • to open the programme menu.
Select programme	Select 🧳 by pressing ∨∧ until the suitcase flashes. Select using •.
Set departure date	Set departure date using ∨∧. Confirm using •.
Set return date	Set return date using ∨∧. Confirm using •.
Change temp. if required	Press ∨∧ to change the temperature (default is 17°C). Confirm using •.
Confirm setting	When ✓ flashes, press • to confirm - 🧳 is now displayed. When the departure date arrives, the following is displayed: 🧳, set period and temperature.

Early return

Select programme menu	If the display is off, press • to activate. Press • briefly to open programme menu.
Select programme	Select programme (P0/P1/P2) using ∨∧. Confirm using •.

Changing an existing travel period

Select programme menu	If the display is off, press • to activate. Press • briefly to open programme menu.
Select programme	Select 🧳 by pressing ∨∧ until the suitcase flashes. Select using •. Select 🕘 by pressing ∨∧ until the clock flashes. Select using •.
Change travel period	Change the period by pressing ∨∧. Select using •.
Change temp. if required	Press ∨∧ to change the temperature. Confirm using •.
Confirm setting	Confirm using •.

Cancelling set travel period

Select programme menu	If the display is off, press • to activate. Press • briefly to open programme menu.
Select programme	Select 🧳 by pressing ∨∧ until the suitcase flashes. Select using •.
Select OFF	Select OFF using ∨∧.
Confirm setting	Confirm using •.

3.9 Function menu

	Installation mode. **Always activate** installation mode when installing/removing the thermostat. The thermostat may be irreparably damaged if not in the correct position during installation.
	Child lock - allows the buttons to be locked so your settings cannot be changed.
MAX **MIN**	Temperature limit - allows you to change the thermostat's temperature range, so you decide what the max and min temperature should be. This is useful, for example, in rooms with public access.
	Set time and date - allows the time and date to be changed after the thermostat is in use.

3.10 Installation mode

Select function menu	Press and hold ⊙ for 3 sec.
Activate installation mode	Select using ∨∧. flashes, press ⊙. Now a large is flashing in the display. The mode is activated and *living eco*® can be mounted.
Deactivate installation mode	Press and hold ⊙ for 3 sec. flashes, press ⊙ to deactivate.

3.11 Temperature limit

Select function menu	Press and hold ⊙ for 3 sec.
Select max/min	Select **max/min** using ∨∧. Press ⊙. Set the max and min temperature using ∨∧. Press ⊙ to approve.

3.12 Setting the time

The thermostat automatically changes to/from daylight saving time.

Select function menu	Press and hold ⊙ for 3 sec.
Select clock	Select using ∨∧. Press ⊙. Set time and date using ∨∧. Select and confirm using ⊙.

3.13 Child lock

Select function menu	Press and hold ⊙ for 3 sec.
Activate child lock	Select using ∨∧. Press ⊙ to activate the child lock.
Deactivate child lock	Deactivate the child lock by pressing all three buttons ∨∧⊙ **simultaneously** for at least 5 sec.

3.14 Replacing the batteries

Remove the battery cover and insert two alkaline AA batteries. Make sure the batteries are correctly oriented.
Rechargeable batteries may **not** be used.

Programme settings are preserved. Time and date settings are reset after 2 minutes and must then be re-entered.

3.15 Open window function

If the thermostat detects a dramatic drop in temperature, for example due to an open window, it reacts by shutting off the heat. The thermostat returns to its original setting after half an hour, or when the window is closed.

3.16 Reset to factory settings

Remove the battery cover and take out one battery. Press and hold for approx. 5 seconds, while reinserting the battery.

4. Technical Settings

4.1 Advanced menu

dS	Deactivate/activate automatic daylight saving time.
Pb	Adjust to radiator/room
Fo	Deactivate/activate intelligent control (forecast)
Or	Information about horizontal or vertical orientation (0 = horizontal, 90 = vertical)

4.2 Deactivating automatic daylight saving time

Select function menu	Press and hold ⊙ for 3 sec. ⮌ flashes.
Select advanced menu	Press both buttons ∨ ∧ for 3 sec.
Select dS	Select dS by pressing ∧. Confirm using ⊙. 1 flashes.
Deactivate feature	Press ∨, 0 flashes. Confirm using ⊙.

1 = automatic daylight saving time (default setting).
0 = no automatic change.

4.3 Adjusting to radiator/room

2 is the factory setting.
1 is used if the radiator appears oversized for the room.
3 is used if the radiator appears undersized for the room.

Select function menu	Press and hold ⊙ for 3 sec. ⮌ flashes.
Select advanced menu	Press both buttons ∨ ∧ for 3 sec.
Select Pb	Select Pb by pressing ∧. Confirm using ⊙.
Select adjustment	Select 1, 2 or 3 using ∨ ∧. Confirm using ⊙.

The frequency of heat adjustment varies for 1, 2 and 3.

4.4 Deactivating intelligent control

The thermostat's intelligent control (forecast) ensures that the desired temperature is reached by a given time.

Select function menu	Press and hold ⊙ for 3 sec. ⮌ flashes.
Select advanced menu	Press both buttons ∨ ∧ for 3 sec.
Select Fo	Select Fo by pressing ∧. Confirm using ⊙.
Deactivate forecast	1 flashes. Select 0 using ∧. Confirm using ⊙.

1 = forecast is activated (default setting).
0 = forecast is deactivated.

4.5 Technical specifications

Actuator type	Electromechanical
Software classification	A
Automatic action	Type 1
Recommended use	Residential (pollution degree 2)
Open window function	Yes
Mechanical strength	70 N (max. force from valve)
Maximum water temperature	90°C
Movement type	Linear
Battery life	2 years
Spindle movement	2-3 mm on the valve
Maximum extension	4.5 mm
Frequency	Measures temp. every minute
Speed of adjustment	1 mm/s
Power supply	2 x 1.5V AA alkaline, class III (SELV)
Power consumption	3 µW in standby, 1.2 W in active state
Operating temperature	0 to 40°C
Transportation temp. range	-20 to 65°C
Temperature setting range	6 to 28°C
Time keeping accuracy	+/- 10 min/year
Clock setting accuracy	+/- 1 min
Size (mm)	L: 91 Ø: 51 (RA)
Ball pressure test	75°C
Weight	177 g (RA)
IP class*	20

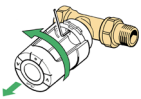
** The thermostat should not be used in hazardous installations or in places where it may be exposed to water.*

5. Safety precautions

The thermostat is not intended for children and must not be used as a toy.
Do not leave packaging materials where children may be tempted to play with them, as this is extremely dangerous.
Do not attempt to dismantle the thermostat as it contains no user-serviceable parts. If error code E1, E2 etc. is shown in the display or other defects appear, please return the thermostat to the distributor.

6. Removing *living eco*®

To remove the thermostat, insert a suitable tool such as an Allen key through the hole in the battery chamber and into the hole in the black ring behind this. Keeping the tool in position, turn the entire thermostat anticlockwise until it is completely free of its mounting.



The thermostat must be set to installation mode before removal (see page 11).

7. Disposal

The thermostat must be disposed of as electronic waste.

Danfoss A/S
Haarupvaenget 11
DK-8600 Silkeborg
Denmark
Phone: +45 7488 8000
Fax: +45 7488 8100
Homepage: www.danfoss.com

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